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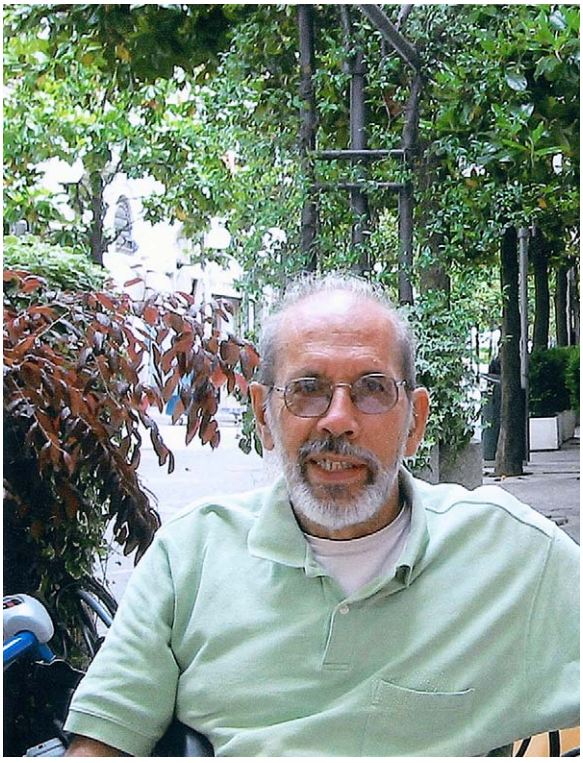
Preface



Wolmer Verçosa Vasconcelos was born in 1937 in the town of Moreno, State of Pernambuco, Brazil. He soon moved to Recife for high school. At that time, Recife had only a few isolated schools at the university level, among them the Engineering School, where Wolmer was admitted after a difficult test, as used to be the admittance procedure to public universities there. He graduated in 1960.

Chicago, Illinois, would be his next mathematical stop, this time for the Ph.D. program. There he benefited from a lively algebraic atmosphere. Irving Kaplansky became his advisor, and Wolmer finished his Ph.D. in 1966. At the very beginning of his career, Wolmer published a couple of papers in a Brazilian journal, perhaps having in mind returning to Brazil in order to build a solid algebra environment in Recife. As often is the case, mother nature had the

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upper hand when he met Aurea, soon to become his wife. After a year at Cornell (1966–67), he accepted a position at Rutgers, where he has been ever since.

Wolmer gradually changed the face of algebra in his Department, which then was mostly centered on general algebra much in the style of those early years. His memorable 1967 paper in J. Algebra, generalizing and giving a direct independent proof of the Auslander–Buchsbaum–Serre homological characterization of regular local rings was a fine piece of ingenuity. True, some of his previous or simultaneous papers carried important homological results related to the Euler characteristic of modules and Cohen–Macaulay rings, but his J. Algebra paper was to become a landmark in the field. In between this early period and the late seventies/early eighties, Wolmer wrote his first book, "Divisor Theory on Module Categories" (North Holland), proposing a general theory of divisors in the category of modules. In parallel, he studied the difficult problem of characterizing rings of small global dimension, thereby slightly swaying between Noetherian and nearly Noetherian rings. His second book, "Rings of Dimension 2" (Marcel-Dekker), reflects the results he obtained in this direction.

In the late seventies Wolmer renewed his efforts to understand the homology of Noetherian local rings and modules. During this phase he proposed a series of well-known homological conjectures about basic modules, such as the conormal module, the module of Kähler differentials and the module of derivations. To this day these conjectures are essentially open.

In the early eighties, he began a systematic study of syzygy theory, along with symmetric and Rees algebras. As a result of a vast collaboration with J. Herzog and A. Simis in this period, he found a homological theory of these algebras based upon a variation on the theme of symmetrization of basic Koszul-like complexes. Various pieces of new homological and arithmetical properties of these and other algebras ensued which had a definite impact in commutative algebra. As a natural offshoot of this period, he published another book, "Arithmetic of Blowup Algebras" (London Math. Soc., Lecture Notes Series), to give a broad overview of the material. This book has since served as a standard reference for work on "blowup algebras".

In the last decade he has become gradually interested in computational aspects of commutative algebra. However, he is mostly attracted to the intrinsic computation of structures rather than the ordinary use of external resources and implementation. In this period Wolmer constructed a broader theory of multiplicities and began a systematic incursion into the complexity of integral closures of ideals and algebras. As a matter of giving a uniform philosophy to his various theoretic-computational devices, he wrote the book "Computational Methods in Commutative Algebra and Algebraic Geometry", published by Springer. The contents of the book greatly differ from the usual accounts of computer algebra techniques and algorithms in that it always emphasizes the internal algebraic essence of computing structures from their raw data. Yet another book is nearly ready whose tone is that of giving an overview of integral closure theory and computation.

Wolmer served on the editorial boards of both *Communications in Algebra* and *Proceedings of the American Mathematical Society* until 2002. In 2003 his numerous contributions were recognized by his election to the Brazilian Academy of Sciences.

There are few areas in commutative algebra which Wolmer has not worked on, and his original ideas have been instrumental in shaping the field. His interest has always been that

of producing a general framework for every problem he considered, but generalization for its own sake was never among his endeavors—in fact, he seems to have a deep dislike for this attitude. The totality of the papers in the present volume in his honor indicates the breadth of his mathematical contacts as well as his enormous capacity for collaboration and scientific interchange over all these years.

Wolmer has always been very interested in working with students and others, helping them in their mathematical theses and careers. Some of these students have become active mathematicians with growing leadership in the area. He has directed around 15 Ph.D. theses at Rutgers and helped many young mathematicians abroad, mainly in Latin America, particularly in Brazil and Mexico. He has had 30 co-authors during his long career.

So far Wolmer's published work includes over a hundred papers and six books. Much more is certain to come in the future. The three editors of this volume and many of the contributors have benefited greatly from the light spirit and always welcoming smile with which Wolmer does mathematics. We wish him good health and good mathematics for years to come!

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Craig Huneke
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